

EVALUATION OF CHALLENGES FACED IN MUCOSAL BIOPSIES IN DENTISTRY- A QUESTIONNAIRE

- **Dr.Casilda Sushanthi.L***

Department of Oral Pathology Saveetha Dental College and Hospitals Saveetha Institute of Medical and Technical Sciences Saveetha UniversityChennai-77.Email: dr.casilda@gmail.com
Phone : 7397729377

- **Dr.Suganya**

Senior LecturerDepartment of Oral Pathology Saveetha Dental College and Hospitals Saveetha Institute of Medical and Technical Sciences Saveetha UniversityChennai-77.

- **Dr.Pratibha Ramani**

Professor and Head,Department of Oral Pathology Saveetha Dental College and Hospitals Saveetha Institute of Medical and Technical Sciences Saveetha UniversityChennai-77

ABSTRACT

INTRODUCTION

It is accepted that the gold standard for most lesions is the microscope analysis. Any abnormal tissues removed from the oral and maxillofacial regions should preferably be submitted to an oral and maxillofacial pathologist.

MATERIALS AND METHODS

A cross-sectional study was conducted through an online survey from January 2021 to March 2020 among Oral Surgeons, Oral Medicine and Oral Oncologists working/practising in Private dental institutions and also private clinical setup.

RESULTS

Out of 100 participants, 31% were below 25 years of age, 38% of participants belonged to the age group of 25-35, 25% of participants belonged to the age group of 36-45 and 6% belonged to the age group above 45 years. Twenty eight percent of the participants were postgraduates belonging to the age group 25-35, with $P=0.000$, which is highly significant. Sixty percent of the participants were postgraduates while 29% of the participants were specialists, 9% were undergraduates and 2% belonged to other specialties

DISCUSSION

Stimulatory training courses for undergraduates to perform biopsy can increase the confidence in the individual and a little forethought can substantially improve the diagnostic value which can be achieved by good interaction between the Oral pathologists and the Clinicians

KEYWORDS:head and neck lesions, mucosalbiopsy, oralcavity, oralpathology, oral surgery

INTRODUCTION

Biopsy, a Greek-derived word for the microscopic examination and diagnosis (bio-life; opsia-to see) loosely translated into 'view of the living' is defined as the removal of tissue from organisms. In 1879 Ernest Besnier introduced the term "biopsy" to medical terminology. The Arab doctor AbulQasim was one of the earliest diagnostic biopsies (1103-1107AD). A needle was used for the puncturing of a goitre.It is accepted that the gold standard for most lesions is the microscope analysis. Any abnormal tissues removed from the oral and maxillofacial regions should preferably be submitted to an oral and maxillofacial pathologist. Exceptions are for tori, exostosis, caring teeth with a weak tissue attached to them, dental pulp removed and tissue that are clinically normal. The clinician needs to decide whether or not a lesion should be biopsied before it is treated¹.

Biopsies are classified as incisional or excisional depending on the technique used. The incisional technique entails removing a representative portion of the target lesion as well as a portion of healthy tissue. If the lesion is extensive, multiple samples should be obtained and placed in separate, properly labelled containers.A schematic representation of the lesions, specifying the original location of each sample, should be attached to the report sent to the pathologist. In the case of suspected malignancy or precancerous lesions, such an approach is recommended. Similarly, when the target lesion is difficult to treat, a multiple sample biopsy should be performed.In the case of suspected malignancy or precancerous lesions, such an approach is recommended. Similarly, when the target lesion is difficult to remove due to its large size or complicated location, a multiple sample biopsy should be performed².

Depending upon the type of lesion that is to be biopsied, significant bleeding may be associated with a vascular lesion biopsy, and precaution should be exercised in any red, purple or blue-coloured or blanked or palpable pulsation lesion

biopsy. In an aesthetic area (e.g. the vermillion limb of the lip), locations of lesion are not a strict contraindication, but in such cases references to a specialist should be taken into consideration. Entities that appear clinically benign or reactive may be excised for aesthetic or functional reasons, but the tissues should be sent for histologic analysis to confirm the clinical impression. Lichen planus, mucous membrane pemphigoid, pemphigus vulgaris, and other immune-mediated disorders can cause widespread mucosal erythema and ulceration, and a biopsy is required to make a definitive diagnosis.³.

The aim of the present study is to analyse the challenges or difficulties faced by Oral Surgeons, Oral Oncologists, Oral Medicine and General dentists with a minimum of one year of experience in biopsy procedures. The assessment of the challenges may help the Oral Pathologists to coordinate better with the Clinicians to achieve a good sample which is the backbone of correct diagnosis.

MATERIALS AND METHODS

Study design

A cross-sectional study was conducted through an online survey from January 2021 to March 2020 among Oral Surgeons, Oral Medicine and Oral Oncologists working/practising in Private dental institutions and also private clinical setup.

Study subjects

A simple random sampling was used to select the study participants. The 100 participants in the study belong to various age groups.

Inclusion criteria

Survey taken from individuals with a minimum of 1 year of experience in biopsy procedures.

Exclusion criteria

General dentists without minimum 1 year of experience in biopsy procedure of oral mucosal lesions.

Ethical approval for the study was obtained from the Institutional Review Board, Saveetha Dental College and Hospitals, Chennai.

Study methods

A questionnaire of 20 closed-ended questions was prepared and distributed online by Google Forms. The collected data were checked regularly for clarity, consistency, and accuracy. Demographic details were also included in the questionnaire.

Statistical analysis

The data collected were tabulated in Microsoft Excel 2016 and exported to SPSS software (IBM® SPSS® Statistics version 24, Chicago, USA). Descriptive statistics to summarize qualitative data in percentages were calculated. Chi-square test was done to associate the knowledge of smokers about health hazards of tobacco use. The confidence level was 95%, with a statistical significance of $P < 0.05$. The results were presented in the form of graphs and tables.

RESULTS

Out of 100 participants, 31% were below 25 years of age, 38% of participants belonged to the age group of 25-35, 25% of participants belonged to the age group of 36-45 and 6% belonged to the age group above 45 years [Table 1]. Twenty eight percent of the participants were postgraduates belonging to the age group 25-35, with $P=0.000$, which is highly significant. Sixty percent of the participants were postgraduates while 29% of the participants were specialists, 9% were undergraduates and 2% belonged to other specialties with $P=0.000$, which is highly significant [Figure:1]. Fifteen percent of the participants working in an institution belonged to the age group 25-35 with $P=0.109$, which is not statistically significant [Figure 2]. Thirty five percent of the participants were working in institutions and had private practise while 31% had only private practice, 28% were working in an institution and 6% were consultants.

Eighteen percent of the participants belonging to the age group of less than 25 years performed less than 25 biopsies per week with $P=0.004$, which is statistically significant [Figure 3]. Forty six percent of the participants have performed more than 25 cases while 39% of the participants have performed less than 25 biopsy cases and 17% of the participants have performed more than 50 biopsy cases in their clinical practise. Nineteen percent of the participants belonging to the age group of less than 25 years assisted more than 25 biopsies with $P=0.000$, which is highly significant [Figure 4]. Forty five percent of the participants have assisted more than 25 oral mucosal biopsy cases while 33% have assisted less than 25 cases and 22% have assisted more than 50 cases.

Sixteen percent of the participants belonging to the age group 25-35 agree that Hemangioma is the most difficult lesion to do biopsy with $P=0.010$, which is statistically significant [Figure 5]. Twenty six percent of the participants opine that Hemangioma is challenging to do biopsy among oral mucosal lesions while 17% opine PMDs, 15% opine mucocele, 13% opine fibroma, 10% blistering lesions, 8% LP, 6% ulcers and 5% Giant cell granuloma (GCG) are difficult to do biopsy. Twelve percent of the participants in the age groups 25-35 and 36-45 opine that inaccessibility to the site is most challenging while 12% agree limited mouth opening is most challenging in during biopsy of oral submucous fibrosis (OSMF) with $P=0.252$, which is statistically not significant [Figure 6]. Thirty five percent of participants agree that

inaccessibility is most challenging during biopsy of Oral Submucous Fibrosis (OSMF) while 31% agree that very firm mucosa is most challenging and 25% agree that limited mouth opening is most challenging and 9% agree suturing is most challenging.

Twenty two percent of the participants in the age group 25-35 agree that friability of the sample was the most challenging during biopsy of blistering lesions with $P=0.542$, which is statistically not significant [Figure 7]. Fifty three percent of the participants agree that friability of the tissue in blistering lesions is most challenging during biopsy while 25% agree hemorrhage is most challenging, 17% agree inadequate sample is most challenging, 4% agree suturing is most challenging during biopsy. Fifteen percent of the participants in the age group 25-35 opine that suturing is most challenging during biopsy of lesions with papillary/proliferation projections with $P=0.192$, which is statistically not significant [Figure 8]. Thirty percent of the participants opine that suturing is the most challenging step during biopsy of lesions with Papillary/Proliferative projections while 27% agree that obtaining adequate sample is most difficult, 26% agree that obtaining intact sample is most difficult, 17% agree that inaccessibility is most challenging.

Thirteen percent of the participants in the age group less than 25 years opine that retromolar region is most challenging anatomical site to access with $P=0.386$, which is statistically not significant [Figure 9]. Thirty one percent of the participants suggest that retromolar area is the most difficult anatomical site to access during biopsy while 26 % agree that floor of the mouth and hard palate are difficult to access and 17% agree that buccal vestibule is difficult to access.

Twenty one percent of the participants in the age group 25-35 opine that achieving hemostasis is most difficult in the floor of the mouth with $P=0.023$, which is statistically significant [Figure 10]. Thirty six percent of the participants agree that achieving hemostasis is challenging during biopsy of lesions in the floor of the mouth while 26% agree that accessibility to lesion in floor of mouth is difficult, 21% agree that size of the lesion is most difficult to biopsy and 16% agree that ease of suturing is most difficult for lesions in floor of the mouth.

Table 1 : Percentage distribution on Challenges faced during biopsy of oral mucosal lesions

Question	Choices	Percentage
Age	<25	31%
	25-35	38%
	36-45	25%
	>45	6%
Qualification	undergraduate	9%
	postgraduate	60%
	speciality	29%
	others	2%
What is the status of your current dental practise?	Working in an institution	28%
	Private practise	31%
	Both mentioned above	35%

	consultant	6%
How many biopsy cases do you encounter per week ?	<5	33%
	>5	62%
	Not applicable	5%
How many oral mucosal biopsy cases have you performed in your clinical practice?	<25	39%
	>25	46%
	>50	17%
How many oral mucosal biopsy cases have you assisted ?	<25	33%
	>25	45%
	>50	22%
What type of biopsy do you prefer for the oral mucosal lesions?	Incisional	48%
	excisional	27%
	Punch biopsy	18%
	Brush biopsy	7%
According to you which is the most difficult/challenging step during biopsy of oral mucosal lesions?	Incision	17%
	Achieving hemostasis	30%
	Adequate sample size	29%
	suturing	15%
	Nature of tissue	9%
What are the most common oral mucosal lesions do you encounter in clinical practice?	mucocoele	18%
	Lichen planus	23%

	fibroma	17%
	hemangioma	8%
	PMDs	34%
Which of the following lesions are difficult to do biopsy ?	mucocoele	15%
	Lichen planus	8%
	fibroma	13%
	hemangioma	2%
	PMDs	17%
	Giant cell granuloma	5%
	ulcers	6%
	Blistering lesions	10%
In your experience, what are the challenges faced during biopsy of oral squamous cell carcinoma?	Profuse bleeding	3%
	Inadequate sample	38%
	inaccessibility	25%
In your experience, what is the difficulty you face during biopsy of OSMF?	Limited mouth opening	25%
	Very firm mucosa	31%
	Inaccessibility to the site	35%
	Suturing	9%
In your experience, what is the challenge you face during sampling of blistering lesions?	Inadequate sample	17%
	hemorrhage	26%
	Friability of the sample	53%

	Suturing	4%
What are the challenges faced during biopsy of oral mucosal lesions that have papillary/proliferative projections?	inaccessibility	17%
	Adequate sample	27%
	suturing	30%
	Obtaining intact sample	26%
Which anatomical site in the oral cavity is most challenging to access during biopsy of oral mucosal lesions?	Retromolar region	31%
	Floor of the mouth	26%
	Buccal vestibule	17%
	Hard palate	26%
	others	0%
In which anatomical site suturing is difficult?	palate	45%
	Floor of the mouth	27%
	gingiva	21%
	vestibule	7%
In your experience, what is the challenge you face during biopsy of oral mucosal lesions in the floor of the mouth ?	accessibility	27%
	hemostasis	36%
	Size of the lesion	21%
	Ease of suturing	16%
What are the challenges faced during biopsy in patients with systemic conditions like diabetes and hypertension ?	Achieving hemostasis	33%
	suturing	35%
	Delayed wound healing at biopsy site	32%

In your experience, do patients develop secondary infection at a biopsy site?	Yes	42%
	no	58%
What is the recurrence rate of the oral lesions	<50	49%
	>50	4%
	Depending upon the lesion	13%
	Not applicable	34%

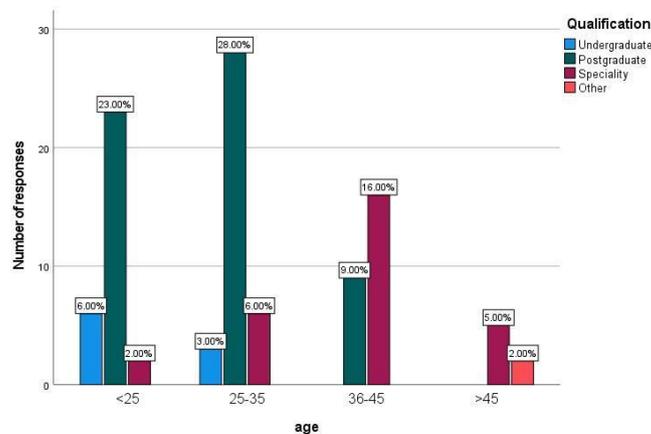


Figure 1: Bar chart depicting the association between Qualification of the participants and age groups. Twenty eight percent of the participants were postgraduates belonging to the age group 25-35, with $P=0.000$, which is highly significant.

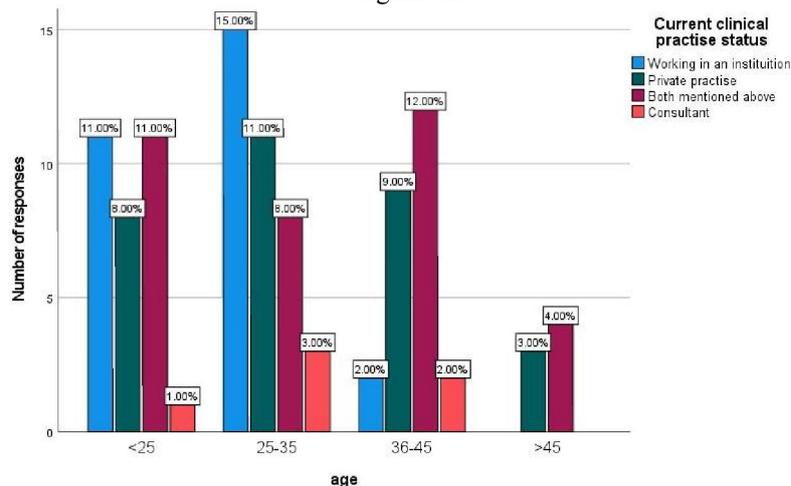


Figure 2: Bar chart depicting the association between Current status of clinical practise of the participants and age groups. Fifteen percent of the participants working in an institution belonged to the age group 25-35 with $P=0.109$, which is not statistically significant.

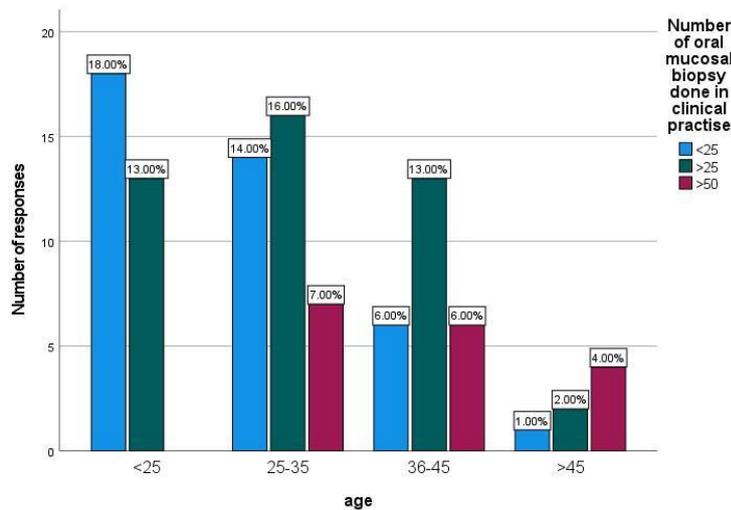


Figure 3 : Bar chart depicting the association between Number of biopsy performed per week and age groups. Eighteen percent of the participants belonging to the age group of less than 25 years performed less than 25 biopsies per week with $P=0.004$, which is statistically significant.

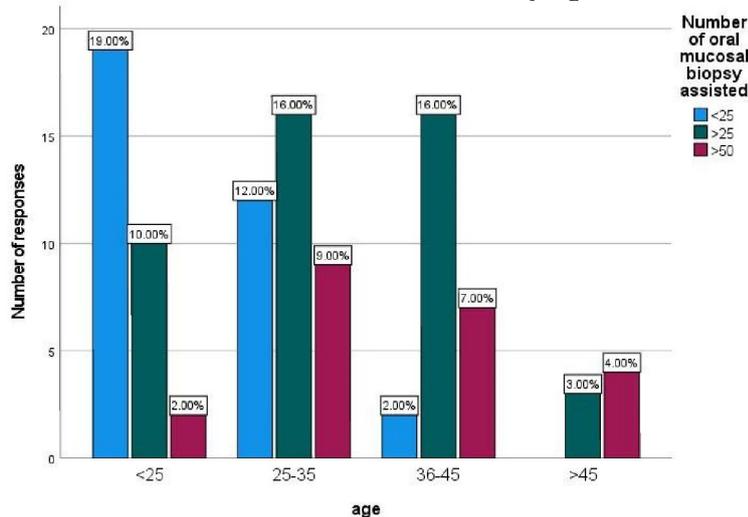


Figure 4 : Bar chart depicting the association between number of biopsies assisted and age groups. Nineteen percent of the participants belonging to the age group of less than 25 years assisted more than 25 biopsies with $P=0.000$, which is highly significant.

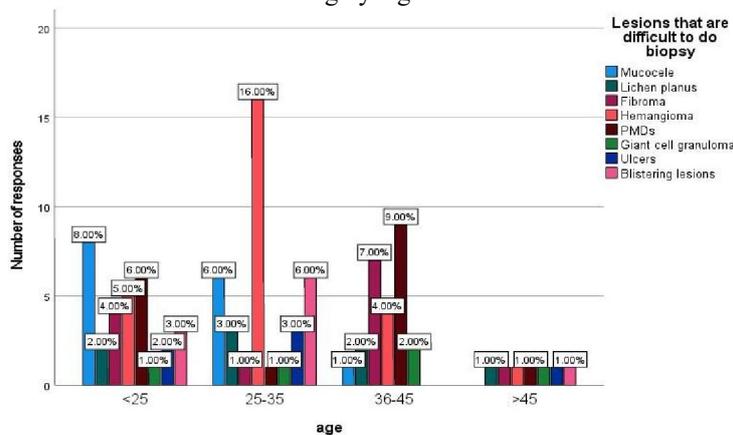


Figure 5 : Bar chart depicting the association between Qualification of the participants and age groups. Sixteen percent of the participants belonging to the age group 25-35 agree that Hemangioma is the most difficult lesion to do biopsy with $P=0.010$, which is statistically significant.

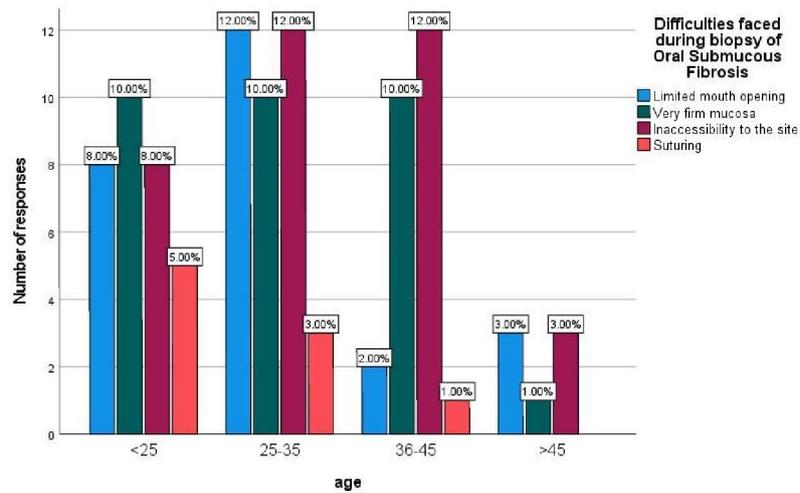


Figure 6 : Bar chart depicting the association between difficulties faced during biopsy of OSMF and age groups. Twelve percent of the participants in the age groups 25-35 and 36-45 opine that inaccessibility to the site is most challenging while 12% agree limited mouth opening is most challenging with $P=0.252$, which is statistically not significant.

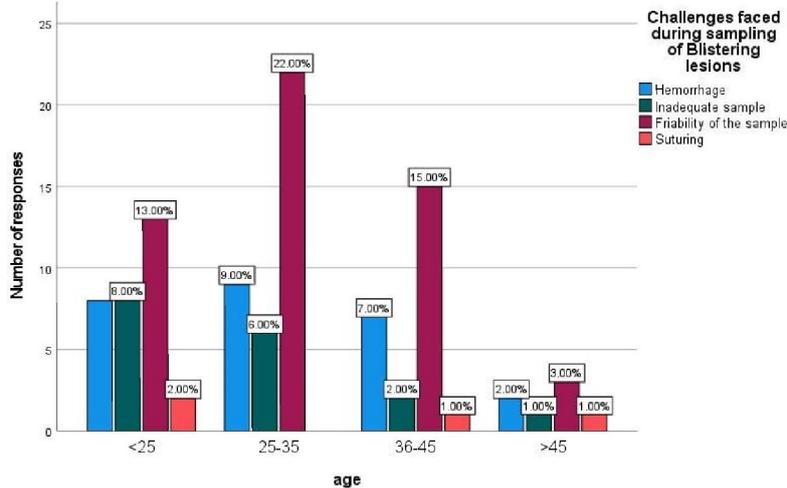


Figure 7 : Bar chart depicting the association between challenges faced during biopsy of blistering lesions and age groups. Twenty two percent of the participants in the age group 25-35 agree that friability of the sample was the most challenging with $P=0.542$, which is statistically not significant.

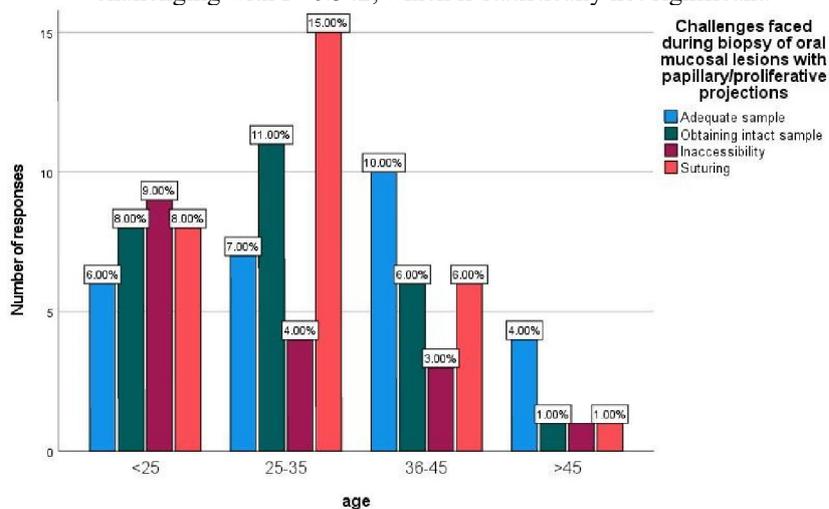


Figure 8 : Bar chart depicting the association between challenges faced during biopsy of oral mucosal lesions with papillary/proliferative projections and age groups. Fifteen percent of the participants in the age group 25-35 opine that suturing is most challenging with $P=0.192$, which is statistically not significant.

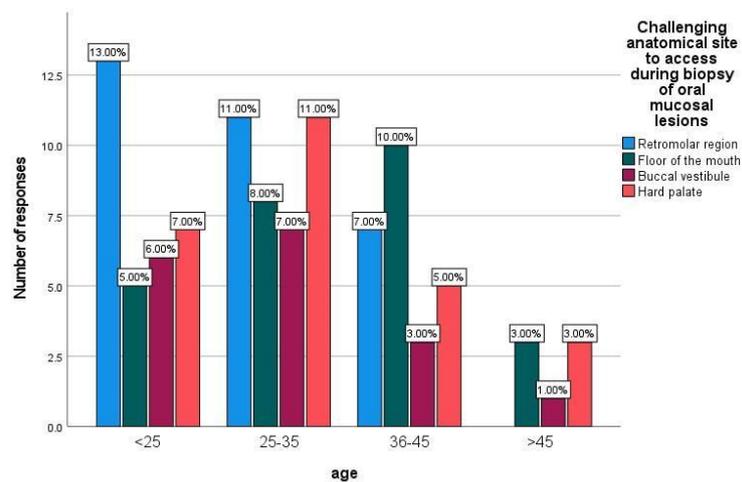


Figure 9 : Bar chart depicting the association between the most challenging anatomical site to access during biopsy of oral mucosal lesions and age groups. Thirteen percent of the participants in the age group less than 25 years opine that retromolar region is most challenging to access with $P=0.386$, which is statistically not significant.

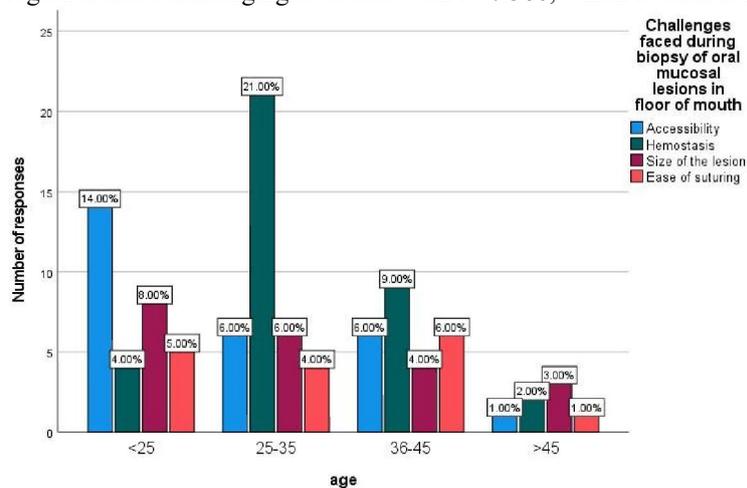


Figure 10 : Bar chart depicting the association between challenges faced during biopsy of oral mucosal lesions in floor of mouth and age groups. Twenty one percentage of the participants in the age group 25-35 opine that achieving hemostasis is most difficult with $P=0.023$, which is statistically significant.

DISCUSSION:

The mucosa of the oral cavity is exposed to tobacco and/or alcohol, which are the potential risk factors for oral cancer, as well as various dental materials and oral hygiene products. The oral cavity contains a plethora of tissue types mainly teeth, taste buds and salivary glands which have different physiologic functions and embryonic origins that are inextricably linked. As a result, the mucosa of the oral cavity is vulnerable to reactive, inflammatory, and infectious lesions. A biopsy of a soft tissue lesion is an important diagnostic tool for assisting histologic diagnosis; however, its clinical relevance is dependent on a thorough clinicopathologic evaluation of the patient's condition⁴.

In our current study we observed that the majority of the participants were either postgraduate students or specialists in surgical procedures while only 9% of the participants were undergraduate students [Figure 1]. This is in accordance with previous literature that states that the undergraduate training in performing oral biopsy procedure was theoretical, and there was a lack of experience or practical skills in performing biopsy. This significant gap between knowledge and professional competence in performing oral biopsy and in the diagnosis of oral cancer is supported by international data showing that the majority of general dental practitioners do not feel competent to perform oral biopsies.⁵

It is also to be noted that 15% of the participants working in institutions were in the age group 25-35 years [Figure 2], 18% of the participants in age group of less than 25 years performed <25 biopsies per week [Figure 3] and 19% of the participants in age group of less than 25 years assisted more than 25 biopsies per week [Figure 4]. These findings in our study highlight the basic requirement of dental practitioners to be more efficient in performing the oral biopsies. Despite being aware of the role of biopsy for an early diagnosis of oral cancer, the number of biopsies performed by general

dentist practitioners is low which might be linked to an insufficient knowledge and experience during their undergraduate and postgraduate education, emphasizing the need to train the dentist in biopsy procedures⁵.

Sixteen percent of the participants belonging to the age group 25-35 years opine that hemangioma is the most difficult lesion to do biopsy [Figure 5], which is in accordance with previous literature that states that biopsy of hemangiomas lead to profuse bleeding. Hemangiomas with surface lesions are effortless to remove, but deeper lesions necessitate extensive surgery, which might lead to deformation of the biopsy site⁶. Hemangiomas are clinically defined as a soft mass that can be smooth or lobulated, sessile or pedunculated, and can range in size from a few millimetres to several centimetres. The management of hemangiomas is determined by several factors, including the patient's age, the size and extent of the lesions, and their clinical characteristics. The important aspect would be to control the profuse hemorrhage during biopsy of the lesion⁷.

Twelve percent of the participants in the age groups 25-35 and 36-45 opine that inaccessibility to the site is most challenging while 12% agree limited mouth opening is most challenging during biopsy of OSMF [Figure 6]. Inaccessibility to the site of biopsy or restricted mouth opening in OSMF patients are mainly due to the formation of bands which primarily constitute collagen and histopathological finding shows areas of hyalinization extending into the submucosal tissues and resulting in decreased vascularity, which is the characteristic feature of OSMF⁸. Very firm mucosa in advanced OSMF is also due to the huge amount of thick collagen present which in turn makes suturing of the biopsy site difficult.

Evaluating the challenges faced during biopsy of blistering lesions, twenty two percent of the participants in the age group 25-35 agree that friability of the sample was the most challenging [Figure 7]. Previous literature evidence shows that maintaining the integrity of the lesion during biopsy is mandatory as in to achieve a proper histopathological diagnosis, since vesiculobullous lesions tend to rupture during biopsy procedure. The friable nature of the sample may not help in achieving a good diagnosis and hence biopsy from more representative areas of the lesion is pivotal⁹. Fifteen percent of the participants in the age group 25-35 opine that suturing is most challenging during biopsy of oral mucosal lesions with papillary/proliferative projections [Figure 8]. The proliferative projections are due to the abundant keratin which makes the biopsy procedure challenging. Obtaining a good sample is difficult due to hyperkeratotic epithelium and lack of an adjacent normal epithelium near the lesion. The pathologist and the clinician should interact for achieving good amount of sample as the underlying carcinoma may not be evident and to overcome difficulty in diagnosis¹⁰.

Thirteen percent of the participants in the age group less than 25 years opine that retromolar region is most challenging to access [Figure 8]. A study by K. DURMUS et al. 2013, state that the retromolar region in the oral cavity is challenging to perform a biopsy or surgical resection due to less visibility of the site and use of robotics in resection of head and neck pathology can ease these difficulties¹¹. Twenty one percent of the participants in the age group 25-35 opine that achieving hemostasis is most difficult in the floor of the mouth [Figure 10]. This finding is in accordance with literature which states that excessive bleeding during implant procedure in the floor of the mouth could be due to the three-dimensional rich vascular supply to the area by the sublingual and submental arteries. Excessive bleeding can also be fatal which is restricted to the anterior region of the floor of the mouth, which makes it critical to understand the course of the artery during biopsy procedure¹².

The authors acknowledge the presence of study limitations such as lesser sample size and online survey format. The 100 participants included integration of postgraduates and specialists from departments of oral medicine, oral surgery and oral oncology and increasing the sample size in each category of the departments can give a more promising data of the challenges during biopsy procedure.

A biopsy is the quickest and easiest way to determine the origin of the lesion for unknown entities and also for confirmatory diagnosis. Stimulatory training courses for undergraduates to perform biopsy can increase the confidence in the individual as well the necessary skill needed for performing biopsy. A little forethought and planning can substantially improve the diagnostic value which can be achieved by good interaction between the Oral pathologists and the Clinicians. Considering the patient's well being, state of mind and treatment initiation, a biopsy must be properly chosen, done, and analysed to avoid diagnostic pitfalls.

CONFLICT OF INTEREST

NONE DECLARED.

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